



# O Meio Ambiente Sustentável 2

**Raissa Rachel Salustriano da Silva-Matos**  
**Analya Roberta Fernandes Oliveira**  
**Samia dos Santos Matos**  
**(Organizadoras)**

**Atena**  
Editora  
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**Raissa Rachel Salustriano da Silva-Matos**  
**Analya Roberta Fernandes Oliveira**  
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**Atena**  
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## APRESENTAÇÃO

A obra “O Meio Ambiente Sustentável 2” possui 21 capítulos com temáticas importantes, que evidenciam a sustentabilidade como a condição de processo viável no presente e no futuro. Visando uma harmonia entre as necessidades de desenvolvimento e a preservação ambiental, sempre focando em não comprometer os recursos naturais das futuras gerações.

A sustentabilidade está atrelada à crescente demanda do avanço mundial, pelo surgimento da necessidade de ampliar estudos que apresentem alternativas de uso dos recursos presentes no ambiente de maneira responsável, sem comprometer os bens e os sistemas envolvidos. Buscando minimizar os impactos, desenvolver a responsabilidade ambiental e fortalecer o crescimento sustentável. Pensar em desenvolvimento aliado à sustentabilidade, envolve aspectos econômicos, sociais e culturais.

Dessa forma, as pesquisas científicas presentes na presente obra, explanam o emprego de sistemas sustentáveis através de levantamentos de consumo, leis, construção civil, economia, gerenciamento e educação ambiental, entre outros diversos fatores em progresso. Os autores esperam contribuir com conteúdos pertinentes para proporcionar auxílio técnico, científico e construtivo ao leitor, como também demonstrar que a sustentabilidade é uma ferramenta importante, tornando-se uma aliada do crescimento. Desejamos uma boa leitura!

Raissa Rachel Salustriano da Silva-Matos

Analya Roberta Fernandes Oliveira

Samia dos Santos Matos

## SUMÁRIO

<b>CAPÍTULO 1</b> .....	<b>1</b>
A RELEVÂNCIA DO CONSUMO SUSTENTÁVEL E DAS LEIS AMBIENTAIS PARA O EQUILÍBRIO DO PLANETA	
Camila Nobrega Oliveira Marinho Wagna Matos da Silva	
<b>DOI 10.22533/at.ed.9952012061</b>	
<b>CAPÍTULO 2</b> .....	<b>13</b>
A SUSTENTABILIDADE NA CONSTRUÇÃO CIVIL E NO PROCESSO DE LIMPEZA DE SUPERFÍCIES	
Marcelo Jose de Mura Jannini Aparecido Fujimoto Giovanna Siste de Almeida Aoki Nayara Messias Lima Antonio Severino Bento Junior Michelle Fernandes Araujo	
<b>DOI 10.22533/at.ed.9952012062</b>	
<b>CAPÍTULO 3</b> .....	<b>25</b>
LEVELIZED COST ANALYSIS: A TOOL FOR STUDYING ECONOMICAL VIABILITY OF NUCLEAR POWER PLANTS	
Alexandre F. Ramos Sophia Moura de Campos Vergueiro	
<b>DOI 10.22533/at.ed.9952012063</b>	
<b>CAPÍTULO 4</b> .....	<b>33</b>
RESPONSABILIDADE SOCIOAMBIENTAL CORPORATIVA: A ORGANIZAÇÃO EMPRESARIAL INTERNA À LUZ DA GESTÃO AMBIENTAL	
Camila Santiago Martins Bernardini Luciana de Souza Toniolli Carlos de Araújo Farrapeira Neto Raquel Jucá de Moraes Sales Fernando José Araújo da Silva Leonardo Schramm Feitosa Juliana Alencar Firmo de Araújo Débora Carla Barboza de Sousa Anderson Ruan Gomes de Almeida	
<b>DOI 10.22533/at.ed.9952012064</b>	
<b>CAPÍTULO 5</b> .....	<b>47</b>
AVALIAÇÃO DA QUALIDADE DO BIOGÁS PRODUZIDO A PARTIR DE DEJETOS BOVINOS, NO MUNICÍPIO DE PARAGOMINAS-PA	
Mauro Dias Souza Wellington Queiroz Ramos José Antônio de Castro Silva	
<b>DOI 10.22533/at.ed.9952012065</b>	
<b>CAPÍTULO 6</b> .....	<b>57</b>
CORRELAÇÕES E ANÁLISE DE TRILHA SOB MULTICOLINEARIDADE EM BIOMASSA FLORESTAL ARBÓREA	
Jonathan William Trautenmüller Juliane Borella	



Rafaelo Balbinot  
Sérgio Costa Junior  
Renata Reis de Carvalho

**DOI 10.22533/at.ed.9952012066**

**CAPÍTULO 7 ..... 64**

EROSÃO POR SALPICO COM CHUVA NATURAL E RESISTÊNCIA DO SOLO A PENETRAÇÃO EM LATOSSOLO VERMELHO-AMARELHO DO OESTE DA BAHIA, BRASIL

Joaquim Pedro Soares Neto  
Ênio da Cunha Dias Magalhães  
Heliab Bomfim Nunes  
Leandro de Matos Barbosa  
Raimundo Guedes de Almeida

**DOI 10.22533/at.ed.9952012067**

**CAPÍTULO 8 ..... 75**

EVALUACIÓN TÉRMICO-ENERGÉTICA DE UN PROTOTIPO DE VIVIENDA SUSTENTABLE CON MATERIALES RECICLADOS

Halimi Sulaiman  
María Paz Sánchez Amono  
Rosana Gaggino  
Lautaro Oga Martínez

**DOI 10.22533/at.ed.9952012068**

**CAPÍTULO 9 ..... 91**

IDENTIFICAÇÃO E ANÁLISE DOS INDICADORES DE RESPONSABILIDADE SOCIAL E AMBIENTAL PARA APLICAÇÃO EM ESTUDO DO ENVOLVIMENTO DAS INDÚSTRIAS DE COMPENSADO DO MUNICÍPIO DE GUARAPUAVA

Carlos Roberto Alves

**DOI 10.22533/at.ed.9952012069**

**CAPÍTULO 10 ..... 105**

INFLUÊNCIA DE FRAGMENTOS FLORESTAIS NO MICROCLIMA URBANO: ESTUDO DE CASO EM CUIABÁ-MT

Fernanda Miguel Franco  
Arthur Guilherme Schirmbeck Chaves  
Marta Cristina de Jesus Albuquerque Nogueira

**DOI 10.22533/at.ed.99520120610**

**CAPÍTULO 11 ..... 119**

O PAPEL DO CURSO DE ADMINISTRAÇÃO NA FORMAÇÃO DE GESTORES AMBIENTAIS

Diego Felipe Borges Aragão  
Isadora Maria de Sousa Camarço  
Luiza Beatrys Pereira dos Santos Lima  
Francisco Lucas de Sousa  
Ermínia Medeiros Macedo

**DOI 10.22533/at.ed.99520120611**

**CAPÍTULO 12 ..... 130**

PARQUE ALDEIA CONDÁ: UM PARQUE DO COTIDIANO PARA UMA CIDADE QUE COMPLETA 100 ANOS

Marc Gomes de Carvalho  
César Pagano Galli  
Leila Pereira Regina dos Santos

**DOI 10.22533/at.ed.99520120612**

**CAPÍTULO 13 ..... 159**

PROPUESTA DIDÁCTICO- EXPERIMENTAL EN INGENIERÍA: ENSEÑANZA DE LA FÍSICA -  
TERMOMETRÍA- CALORIMETRÍA

Darío Rodolfo Echazarreta  
Norma Yolanda Haudemand

**DOI 10.22533/at.ed.99520120613**

**CAPÍTULO 14 ..... 172**

SUSTENTABILIDADE AMBIENTAL: CONTROLE ALTERNATIVO DE *Pachycoris torridus* SCOPOLI, 1772  
(HEMIPTERA: SCUTELLERIDAE) COM *Azadirachta indica* A. JUSS. (MELIACEAE)

Wellyngton Lincon Panerari Ramos  
Anelise Cardoso Ramos  
Bruno Vinicius Daquila  
Elton Luiz Scudeler  
Daiani Rodrigues Moreira  
Satiko Nanya  
Helio Conte

**DOI 10.22533/at.ed.99520120614**

**CAPÍTULO 15 ..... 183**

SUSTENTABILIDADE, CRESCIMENTO E DESENVOLVIMENTO: UM ESTUDO EM COMUNIDADES DE  
UMA RESERVA EXTRATIVISTA DA AMAZÔNIA

Marcelo Augusto Mendes Barbosa  
Aline Ramalho Dias de Souza  
Jacira Lima da Graça  
Joyce Anne de Oliveira Freire

**DOI 10.22533/at.ed.99520120615**

**CAPÍTULO 16 ..... 196**

TRILHAS INTERPRETATIVAS: RECURSO METODOLÓGICO PARA O ENSINO DE EDUCAÇÃO  
AMBIENTAL EM BARREIRAS/BA

Maria Jamile de Queiroz Pereira  
Muriely dos Santos de Oliveira  
Rafael Guimarães Farias

**DOI 10.22533/at.ed.99520120616**

**CAPÍTULO 17 ..... 209**

DESIGNING THE TEMPORARINESS: ENVIRONMENTAL ISSUES

Rossella Franchino  
Caterina Frettoloso  
Nicola Pisacane

**DOI 10.22533/at.ed.99520120617**

**CAPÍTULO 18 ..... 220**

DISCLOSURE AMBIENTAL E A SUSTENTABILIDADE EMPRESARIAL

Francinildo Carneiro Benicio  
Antônio Vinicius Oliveira Ferreira  
Ana Luiza Carvalho Medeiros Ferreira  
Lennilton Viana Leal  
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Marianne Corrêa dos Santos  
Auristela do Nascimento Melo  
Diógenes Eldo Carvalho de Barbosa Sobrinho

**DOI 10.22533/at.ed.99520120618**

**CAPÍTULO 19 ..... 238**

ASPECTOS INSTRUMENTAIS DA LIDERANÇA COLABORATIVA EM APOIO A GESTÃO DA INOVAÇÃO EM RECICLAGEM

Jacira Lima da Graça  
Raul Afonso Pommer Barbosa  
Flávio de São Pedro Filho  
Aline Ramalho Dias de Souza  
Carlos Alberto Mendes Moraes  
Marcos Vinícius Moreira  
Marcelo Augusto Mendes Barbosa  
Joyce Anne de Oliveira Freire

**DOI 10.22533/at.ed.99520120619**

**CAPÍTULO 20 ..... 251**

VIABILIDADE ECONÔMICA DE GERAÇÃO FOTOVOLTAICA NO AEROPORTO DE BELÉM-PA

Marco Valério de Albuquerque Vinagre  
Ari Ricardo Sousa de Moraes  
Leonardo Augusto Lobato Bello  
Maria Lúcia Bahia Lopes  
Alberto Carlos de Melo Lima

**DOI 10.22533/at.ed.99520120620**

**CAPÍTULO 21 ..... 267**

YOGA E CUIDADO DE SI: POR UMA CULTURA ECOLÓGICA, DE PAZ E NÃO-VIOLÊNCIA

Otávio Augusto Chaves Rubino dos Santos  
Allene Carvalho Lage

**DOI 10.22533/at.ed.99520120621**

**SOBRE AS ORGANIZADORAS ..... 280**

**ÍNDICE REMISSIVO ..... 281**

## DESIGNING THE TEMPORARINESS: ENVIRONMENTAL ISSUES

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Aversa – Italy

**ABSTRACT:** Italy is dotted with numerous sites previously used that are potential asset for new uses, subordinated to their rehabilitation. These areas are also a heavy inheritance because very often the previous anthropic activities have strongly compromised the ecosystem quality. The consequences are even more worrying, due to the fact that often these sites are located in densely populated urban areas. On this matter, in

order to find an alternative to the model that was imposed in the last century, all the interventions concerning the recovery of areas -affected by previous human activities- must be tackled on the way of rational use of resources. It is true that the time that passes between the old and the new intended use, the so-called “middle time”, is often long and not always controllable, so it happens that abandoned places become a burden for the balance of a community. Through public-private agreements these spaces can be returned to the community for the realization of low-cost activities and projects that can quickly restore the compromised relationship between users and public spaces. There are numerous experiences that propose more complex urban regeneration strategies in which unused spaces become a resource for the city providing a quick response to user needs in terms of space availability and increase in quality of life. In this regard, the paper examines two international case studies relate to urban redevelopment projects in different geographic areas that share aspects and choices according to the logic just mentioned. The critical examination of this cases studies allows significant considerations on the use of nature in managing the impermanence of urban transformations and represents the starting point for proposing innovative urban



regeneration strategies aimed at improving ecological and environmental performance and reaction capacity in the context of the delicate relationship between natural and built environments.

**KEYWORDS:** Degraded areas, urban farm, ecosystem quality

## 1 | REDRAW URBAN AND IMPROVE QUALITY OF SPACES THROUGH SOCIAL INVOLVEMENT (NICOLA PISACANE)

The paper describes two international case studies in different environment in which the reuse of abandoned places become the opportunity for social revamp of inhabitants and to improve the quality of an urban area.

The first case study is localized in the Land of Fire (Tierra del Fuego), in particular the municipality of Ushuaia in the extreme south of Argentina where in 2004, a project to protect the environment of an urban area was started. The Yatana Forest was born both as an artistic project than an urban reserve with the aim of saving the urban development of the city of Ushuaia an entire urban block (<http://bosqueyatana.wixsite.com/bosqueyatana>). The goal of recovery of a native forest of “lenga” in the urban city center of Ushuaia starts with the aim to preserve a natural place that was now reduced to landfill, but from the desire for social redevelopment of a place that became a center for drug and alcohol consumption. The forest is characterized by plants of “lenga” (*Nothofagus pumilio*), also known as “deciduous dwarf beech”, “kuturn” and “kicharrn” distinctive of local vegetation and, according to the description by Luca Bridges, is an arboreal species coming from the Andes, from Chile and from Tierra del Fuego and therefore extremely resistant to harsh climates and snow-rich areas.

The NGO Fundacion Cultivar, through an agreement with the Municipality of Ushuaia, takes possession of this place and starts a process of reconversion of a degraded space to develop an educational-environmental process of the forest also employing artistic forms as a means of sensitization and transmission of local cultures. The redevelopment of this area is conducted exclusively through the voluntary work of the Foundation itself and local citizens. The global operation has led to positive results in terms of cultural enhancement and awareness, in particular of children, towards the protection of the environment. In about ten years, educational projects have seen participation through the involvement of schools and thousands of children, involved in the growth of their environmental awareness through art and awareness of the culture of the earth. At the natural laboratory in which the activities involving children and locals take place, there is the Casa Alvarado, from the name of the family that has strongly promoted this project and that since 1946 has welcomed their ancestors coming from the island of Chiloe. The house was flanked by 5 hectares of land in which there was also a minimum production for the needs of the

inhabitants and was one of the many isolated houses in the green that characterized Ushuaia. The urban development of the city and population growth have led to the removal of many natural spaces and the destruction of wooden buildings typical of the area. The same urban growth has reduced the extension of the land attached to the Casa Alvarado from 5 to 2 hectares, through the demolition of numerous trees and the transformation into building land. The action of the Fundación Cultivar has managed to preserve intact the original image of a portion of the city and to start an important urban and social recovery project that can be a model for many realities.

The other case study analyzed has been carried out with the same participation of local community but with a different spirit and purpose. The Spiral Garden Community Food Security Project is born in Berkeley in the United States of America, in California (<http://www.spiralgardens.org/index.html>). The project started in 1993 by a non-profit pacifist institution: the Agape Foundation. The Foundation has been operating in the Bay Area since 1969 to encourage the community to participate in actions aimed at increasing urban green spaces, applying innovative methods of organic cultivation, for food security and promotion of principles for environmental fairness. The participation of citizens from the design stage of the garden, through questionnaires and sharing opinions, represent opportunities for social participation in a project to revive the community and improve the living conditions and the place of residence. With this premise, some areas of the deceased Santa Fe Railroad rail have been converted, creating an urban vegetable garden model. The main activities carried out within the Spiral Garden are nurseries and agricultural production. The first comes with the desire to offer plants and trees that can produce safe and healthy food and respecting the typical features of the Bay Area; at the same time the nursery activity guarantees, together with the donations, the economic support. The agricultural production, conducted according to analogous principles of the nursery, is carried out by volunteers, who reside mainly in the surroundings of the Spiral Garden. All production is not for sale but is shared among those who contribute to the conduct of this project.

In this context the landscape is configured as an organic unity born from the complex combination of physical and natural phenomena and objects, firmly connected each other by mutual relations. The dialogue between man and the set of elements that characterize the environment is not a prerogative of the modern world. Inhabitants have always tried to relate to the surrounding reality, as they have always been confronted with a rich heritage, which they have felt over time the need for in-depth knowledge. In fact, the civilizations that have inhabited places have always tried to study and then use thoroughly in its complex unity the landscape. Today urban landscape, as it is revealed at our eyes, appears complex and articulated and therefore difficult to represent and describe.

## 2 | TRANSITIONAL TRANSFORMATION WITH THE USE OF NATURAL RESOURCES (ROSSELLA FRANCHINO)

For those working in the field of environmental protection, with particular attention to resource management issues in recovery interventions of the territory, performance optimization and the search for reversible working practices is a prerequisite for the principle of intergenerational equity to be implemented.

Urbanization with the implications of a climatic, ecological and soil consumption nature has a significant impact on the environment as well as the environmental resources in general. The sustainability of buildings is therefore the key to the development of the cities of the future.

To intervene on urban development in order to find an alternative to the model that was imposed during the last century, a sustainable approach is required that places the territory as a fabric in which the border between the artificial and natural environments is not detected and in which each process is controlled so that its impact and, consequently, the irreversible degradation induced is the minimum possible in relation to the constraints of the process itself.

Anthropic activity, with interrelated complex structures and relationships determines its own track in the environment, with it being a sign of decay and eventually left as a burden on future generations. In order to limit the footprint, it is necessary to assume that any transformation interventions have the goal of making sustainable changes to the environment in which they will be carried out.

It is therefore a priority to orient any transformation intervention so that the unavoidable impression is contained as much as possible, with this being achieved by increasing the load capacity defined as the ability to absorb and control the anthropization phenomena with a sustainable impact on the ecosystem.

The reuse mode, reconfiguration, natural landscape and usability are all closely related aspects in order to achieve a renewed quality of the environmental conditions of the area as a whole.

The transformation of the areas previously used for human activities is often approached from two perspectives, that are independent of each other: technical and landscape. The first deals with the technical design of the processing operations, not particularly linking it to the next intended use and merely focused on checking the quality of the environmental matrices. The second focuses on the final configuration and the new use of the site, often underestimating the need of the technical intervention so as to remove the causes of the deterioration of environmental quality. The final result is that of obtaining, except in some particularly interesting cases, either a global control of environmental quality, that is often not in synergy with the reuse intervention of the site or a superficial arrangement without any control of the affected environmental subsystems.

It is therefore essential to identify the technical assistance required to monitor the environmental matrices in each case, but it is also highly significant that the intervention is structured in close synergy with the site's environmental transformation. The cases that may occur are varied and depend on both the previous use of the site as well as the new reconfiguration, with them ranging from just a functional disposal so as to move the activities to another place or decommission with ecological and environmental implications due to the previous use.

Whatever the case maybe, the re-use of degraded areas is strictly subordinated to their reclamation which includes all the actions necessary to reduce the pollutants to a level below the legal limits as well as removing all sources of the pollution so as to ensure the preservation of the quality of the various environmental matrices.

It is therefore necessary that the recovery of degraded areas are structured in order to:

- ensure the preservation of the quality of the various environmental matrices;
- remove all the possible sources of pollution;
- reduce the concentrations of pollutants to a level below the acceptable limits established according to the legal limits and the future use of the area.

In addition, these actions, in agreement with the above premises, must be carried out in a way that does not take into account the final objective of recovery, the new features of the site, its overall ecological reconfiguration and the means needed in order to achieve it. It is, therefore, highly important to customize the environmental control intervention by identifying the technological systems necessary, case by case, favouring the application of natural ones or with small engineering that, of course, make the intervention even more environmentally effective.

In this context, when the characteristics of the intervention allow it, the use of technologies that utilize the water and green resources is proposed in order to use the principles of nature as a model of sustainable management by stimulating the intrinsic natural potential of the resources that have not been developed due to considerable anthropization.

### **3 | LOW-COMPLEXITY GREEN STRATEGIES FOR URBAN OPEN SPACES RE-USING (CATERINA FRETTOLOSO)**

Urban voids, unused areas, spaces without a clear project that clarify their use, often constitute a critical point within a broader balance of quality and efficiency of an urban context. Moreover, it is true that the time that passes between the old and the new intended use, the so-called “middle time”, is often long and not always controllable, so it happens that abandoned places become a burden for the balance of a community. It is necessary



to promote strategies and projects that, in a short time, can restore dignity and quality to these spaces as well as restore the compromised relationship between users and public spaces.

This means, as demonstrated by the case studies mentioned, on the one hand the identification of compatible functions, on the other, the active participation of the population. These two aspects can guarantee the rapid start of the project and, above all, its acceptance once delivered to the city.

The redevelopment of urban spaces also in a temporary way can, under this logic, offer interesting development prospects, especially if associated with the introduction of green productive systems. The introduction of green productive systems in the city “should not be simplistically understood as a new declination of the principle of greenhouse cultivation or livestock breeding; the symbiotic valences induced by the organic material used and produced can generate useful synergies with the context in which the “farm of the new millennium” is introduced, opening a range of possibilities on the strategic plan of both urban and architectural planning” (Musacchio, 2011). The productive green interventions in the city highlight very different solutions in relation to a set of variables that contribute to the success of the actions put in place: from the micro-climatic conditions to the human and economic resources available.

Quality of life and sustainability are the cornerstones of any international strategies linked to urban development and, therefore, share the idea that “Smart City technologies must be consistent with the future needs of citizens and not only with current ones; that is, they must be able to adequately support the sustainability path of urban areas” (Brini, Medici, 2017). From a smart perspective, where the project starts from the specific characteristics of the places and the needs of those who use them, it is necessary to “focus on the relationship between lifestyles, basic needs, an economy based on local resources and a coherent technology and social organization in order to also reduce the negative impacts on the environment” (Brini, Medici, 2017). In eco-oriented urban transformation processes, on the one hand, there is the issue of urban regeneration according to the smart approach mentioned above, while on the other, the need to re-introduce the user to the centre of the urban project according to a human oriented approach that includes, not only participation but, above all, a conscious use of the places by the citizens. In a logic of strengthening the user-urban space relationship, the designing of open spaces assumes a leading role, with it being defined as new generation, in places where the actions to improve the technological-environmental quality are integrated with an inclusive approach. This is due to some design-action areas: protecting and increasing biodiversity and resilience aimed at implementing the ecological and social network on a local scale; good practices for the design, maintenance and management of green spaces (UNI, 2014). The eco-oriented design of common spaces therefore becomes extremely important in reducing the environmental impacts of the urban settlement itself, especially, if we think

of all those activities related to housing which burden with the environmental balance of the neighbourhood contributing to create discomfort conditions for inhabitants, when they aren't properly managed.

“The growing awareness of the unsustainability of the model of the city in the developed world” and the evident socio-economic problems of some parts of the population in this part of the world, has given a strong impulse to urban agriculture movements and interventions also in these contexts (Palumbo, 2012). In recent years, despite the fact that there has been a significant growth not only of large cities but also of smaller urban areas where there is a growing demand for services for the community, an intensification of spaces has been observed (urban gardens, vertical walls, roofs) dedicated to urban agriculture, a sort of re-appropriation of the soil removed from nature. In this logic, urban agriculture, appropriately oriented, can be considered a strategy to propose models of better performing cities starting from the sharing of founding principles such as resilience, sustainability and hospitality (De Filippi, Saporito, 2017) contributing “to increasing the environmental quality of cities (...) [as well as] closing the open loop (Smit and Nasr, 1992), of cities, using local resources (including water and waste) putting other resources in circulation (food, compost, but also no-food products) such as wood for biomass or fabrics, thus contributing to its ecological balance” (Gallo, Casazza, Sala, 2016).

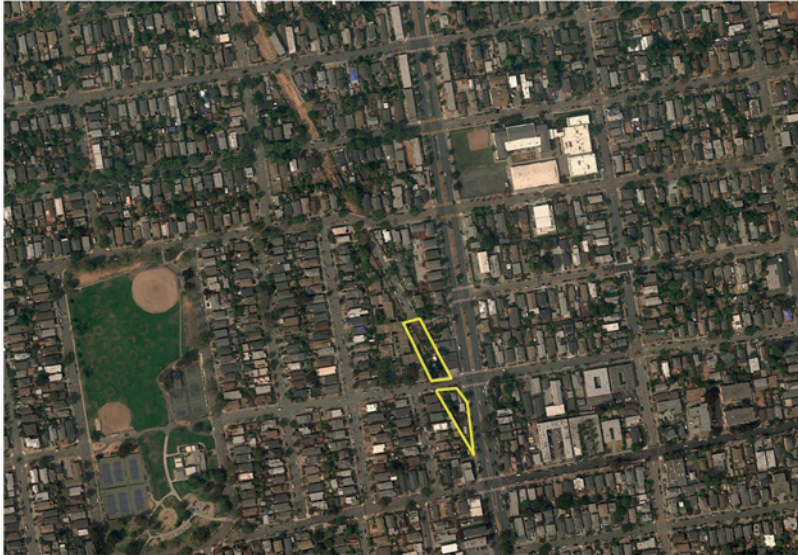
The two international urban agriculture projects from which our reflections are inspired, show the adoption of low-tech strategies that are suggested, for the most part, by traditional technologies that are appropriately contextualized, but which share a common goal: to stimulate social innovation and raise the citizens' awareness. “In the context of greening urban infrastructures”, especially in countries with scarce resources, “it is possible to support the opportunity to resort to solutions with reduced technological complexity and low costs, i.e. those that allow for the growth and development of planta with minimum maintenance and with the lowest initial investment” (Bellini, 2013) so as to encourage its management and use.

Also shares this approach the urban agricultural project “Floating Fields” by Thomas Chung. This urban gardens located in the pools of the Bay of Shenzhen, today an important industrial junction characterized by overpopulation and high levels of water and air pollution, highlights, on the one hand, the need to recover the environmental and social dimension that the area once had, while on the other, to satisfy the food needs. The platforms, which host a series of plants, algae, vegetables, have a hydroponic and water filtration system, while also allowing for the growth of plant varieties without exploiting any energy or soil.

The idea, also based on the case studies selected in this paper, is that of a low-tech innovation: a “simplification of the product” which translates into the reduction of the possibilities of wear, breakage and, consequently, of the costs associated with them. Finally, it is worth remembering that in order to guarantee an effective result from a performance point of view, low-tech strategies must integrate technical simplicity with architectural

quality. “A careful and close look to many areas and vacant lots, (...), shows us how, in the absence of real estate development, many areas have become a testing ground for different populations, new forms of art, music, pop culture, as well as the place to start-up for associations related to social projects for temporary student housing, spaces for events, or entertaining, for gardening, informal markets for trade. The uncertainty and openness of these places has catalyzed new forms of cities (Oswalt 2003), has inspired temporary activities and projects, has allowed the initiation of self-organized informal economies and new services to local contexts. The empty spaces can be understood as urban reserves for testing the collective dreams... (...). These places become a laboratory to observe the tactics of self-organization of the post-capitalist city” ([http://www.temporioso.org/?page\\_id=1345](http://www.temporioso.org/?page_id=1345)).





### SPIRAL GARDEN

Location: Berkeley - California (USA)

Area: 3000 sqm

Promoter: Fondazione Agape

Prevailing type of green: vegetable green

Year: 1993



Figura 1. Spiral Garden - Berkeley - California (USA)





#### YATANA WOOD

Location: Ushuaia - Tierra del Fuego (Argentina)

Area: 2 hectares

Promoter: Fundacion Cultivar

Prevailing type of green: lenga (*Nothofagus pumilio*)

Year: 2004



Figura 2. Yatana Wood - Tierra del Fuego (Argentina)

## 4 | CONCLUSIONS

This work has studied the application of natural resources in the sustainable management of urban transformation and has shown, through appropriately structured

case studies, the significant environmental benefits arising from the use of principles of nature as a management model. Using nature's own ability to control the negative effects of urban transformation and focusing on rebalancing green areas is, among other things, not only environmentally, but also economically and socially convenient.

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## ÍNDICE REMISSIVO

### A

Administração 35, 99, 119, 121, 123, 124, 125, 126, 127, 128, 129, 137, 220, 221, 224, 236, 242, 244, 248, 249, 250, 267

Aeroporto 251, 254, 255, 256, 257, 261, 262, 265

Amazônia 55, 183, 184, 185, 189, 190, 191, 193, 194, 220, 251, 255, 256, 257, 265, 266

Aprendizagem 13, 17, 22, 196, 197, 198, 199, 239, 240, 242, 243, 245, 246, 249

Áreas Verdes 105, 107, 112, 113, 117, 132

Atributos do solo 64

### B

Balanço Social 92, 95, 96, 99, 103, 104, 236

Biodigestores 47, 48, 50, 56

Biogás 47, 48, 49, 50, 51, 52, 54, 55, 56

Biomassa 47, 48, 49, 50, 55, 57, 58, 59, 60, 61, 62, 63

Biomassa florestal 49, 57, 58

Biopesticida 173

### C

Calorimetria 159

Clima Urbano 105, 106, 116, 118

Combustível nuclear usado 26

Compactação do solo 64, 71, 202

Compensado 91

Conduta Sustentável 34

Construção Civil 13, 14, 15, 16, 17, 21, 23, 93, 200, 206

Consumo 1, 10, 11, 14, 15, 16, 19, 20, 35, 41, 76, 81, 82, 84, 85, 86, 87, 95, 102, 121, 122, 127, 135, 168, 193, 201, 224, 229, 251, 254, 255, 257, 261, 262, 264, 265, 274, 278

Consumo energia 14

Controle alternativo 172, 174

Cooperativa de recicláveis 239, 246

Correlação de Pearson 57

Cuidado de si 267, 268, 269, 274, 275, 276, 279

Cultura Ambiental 34, 44, 45

Cultura de paz 267, 268, 271, 276, 278, 279

## D

Degraded areas 210, 213  
Dejetos bovinos 47, 48  
Desagregação do solo 64, 65, 69, 71, 72  
Disclosure ambiental 220, 223  
Diseño bioclimático 75, 76, 77, 78, 81, 87  
Divulgação Ambiental 221, 223

## E

Ecologia 199, 267, 268, 273, 274, 276, 278, 279  
Ecosystem quality 209, 210  
Educação 1, 10, 11, 20, 24, 38, 42, 105, 119, 121, 122, 123, 126, 128, 129, 139, 156, 192, 196, 197, 198, 199, 200, 207, 208, 267, 268, 270, 274, 275, 278, 279  
Efeitos diretos e indiretos 57, 58, 59, 60, 61  
Energia renovável 251, 252, 265  
Energia Solar 251, 254, 255, 257, 262, 265, 266  
Ensino 14, 16, 120, 125, 126, 127, 128, 129, 192, 193, 196, 197, 199, 200, 207, 244, 245, 246, 248, 267  
Envolventes 75, 76, 90  
Erosão 64, 65, 66, 69, 70, 73, 74, 202  
Espaço Urbano 117, 132, 133, 205, 251, 255, 265  
Estrategias de enseñanza 159  
Extrativismo 183, 184, 185, 191, 193, 194

## F

Floresta Estacional Decidual 57, 59, 63  
Fotovoltaica 251, 252, 255, 257, 259, 266  
Fragmentos florestais 105

## G

Gás Metano 47, 49, 51  
Gestão 26, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 49, 92, 95, 103, 104, 119, 120, 122, 123, 125, 126, 127, 128, 129, 137, 183, 185, 194, 234, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 247, 248, 249, 250, 253  
Gestão Ambiental 26, 33, 34, 35, 36, 37, 39, 40, 42, 43, 44, 45, 46, 103, 119, 120, 122, 123, 126, 127, 128, 129, 236  
Gestores ambientais 119, 123

## H

Hemiptera 172, 173, 179, 180, 181, 182

## I

Índice de Sustentabilidade Empresarial 221, 222, 227, 236

Inovação 15, 122, 173, 188, 238, 239, 240, 241, 242, 243, 244, 245, 247, 248, 249

Inseto-praga 173

## J

Jatropha curcas 173, 174

## L

Latossolo Vermelho-Amarelo 64

LCOE 25, 26, 27, 31

Leis ambientais 1, 6, 11

## M

Materiales reciclados 75, 78, 79

Microclima Urbano 105

Morfologia 172, 173, 174, 175, 176, 177, 179

Multicolinearidade 57, 58, 59, 60, 61, 62, 63

## N

Não-violência 267, 269, 271, 272

Nim 172, 173, 174, 175, 176, 177, 178, 179, 180, 181

## P

Parques 117, 130, 131, 132, 133, 138, 140, 141, 145, 156, 244

Planejamento Urbano 131, 132, 133, 157

Planeta 1, 3, 6, 7, 9, 11, 95, 130, 224, 227, 248, 269, 273, 274

Política públicas 14

Práticas sustentáveis 33, 34, 35, 43, 44, 119, 124, 125, 126, 127, 128

Problemas Integradores 159, 171

## R

Reciclagem 1, 8, 9, 11, 26, 229, 238, 242, 245, 246, 247, 249, 250, 274

Reciclagem e Legislação 1

Recurso metodológico 196, 198, 207



Relatórios de Sustentabilidade 97, 221, 223, 227, 229, 230, 231, 232, 233, 234, 235  
Reservas Extrativistas 183, 184, 185, 188, 189, 191, 194  
Resíduos reciclados 75, 76, 78  
Responsabilidade Socioambiental 33, 36, 37, 41, 43, 44, 91, 92, 93, 94, 95, 103  
Revitalização 131, 149, 156  
Roteiro interpretativo 196

## S

Saneantes Domissanitários 14, 15, 17, 18, 19, 21  
Setor Privado 34, 45  
Silvicultura Urbana 105  
Simulación térmico energética 75, 76  
Socioambiental 33, 36, 37, 41, 43, 44, 91, 92, 93, 94, 95, 98, 103, 199, 225, 243, 248  
Sustentabilidade 1, 2, 3, 5, 7, 8, 10, 11, 13, 14, 15, 20, 21, 23, 24, 38, 39, 40, 45, 74, 91, 92, 95, 97, 102, 103, 104, 119, 120, 121, 122, 123, 126, 127, 128, 129, 172, 183, 184, 185, 186, 187, 188, 191, 193, 194, 197, 198, 207, 220, 221, 222, 223, 224, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 241, 251, 265, 274  
Sustentabilidade ambiental 7, 11, 13, 15, 45, 122, 172, 227

## T

Temporariness 209  
Teor de água no solo 64, 71  
Térmico-energética 75, 90  
Termometría 159  
Trabajo experimental 159, 169  
Trilhas 196, 197, 198, 199, 207, 208

## U

Urban farm 210  
Usinas Nucleares 25

## V

Viabilidade econômica 25, 251, 266

## W

Wikiloc 196, 198, 200, 201



## Y

Yoga 267, 268, 269, 270, 271, 273, 274, 275, 276, 277, 278

 **Atena**  
Editora

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